AN ANALYSIS OF LAND OWNERSHIP PATTERNS IN OKLAHOMA TO PROJECT FUTURE FARM REAL ESTATE TRANSFERS AND FINANCIAL NEEDS

By

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PREFACE

This study is concerned with the agricultural land ownership patterns in Oklahoma. The primary objective of this study is to determine the age distribution of farm landowners in Oklahoma in order to estimate the extent of land transfer and the resulting capital needs that may be anticipated over the next decade. A sample survey consisting of 60 random congressional townships was conducted to identify future patterns of farmland ownership in Oklahoma.

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CHAPTER I

INTRODUCTION

Land is the single most significant capital input to agriculture. Farm real estate capital requirements needed to effectively control a viable production unit continue to expand. Farmers have traditionally been able to supply a large proportion of their capital needs from accumulated savings and equity. However, as farmers strive to achieve economies of size and to adopt new technology, capital requirements per farm operator unit increase significantly. If past trends continue, substantial amounts of capital will be needed in the future to maintain an adequate farm unit. The purpose of this study is to determine the age distribution of landowners in Oklahoma in order to estimate the extent of land transfer and the resulting capital needs that may be anticipated over the next decade.

The successful intergenerational transfer of farm assets requires knowledge regarding the extent of capital required and also the sources of such capital. In this day and time when non-agricultural factors are thought to be driving up land prices, it is very difficult for young farmers to obtain sufficient financing.

In 1977, 73,316 farmland transfers occured in the U.S. involving 20.1 million acres. This farmland was valued at $12.75 billion and required an incurred debt of $9.74 billion, or a ratio of debt to purchase price of 76.3 percent. Farmland acreage transferred reached a

high of 38.6 million acres in 1974, but has been relatively steady the past three years (15). This is largely due to the reduction in the number of sales in the Southern Plains and Mountain States where the average size of tract sold is much larger than the national average. In these areas, many prospective buyers have apparently adopted a wait-and-see policy because of the weak cattle market, the depressed wheat market, and the drought (15). Nonetheless, for the year ending March 1, 1977, the total farmland value transferred in the U.S. increased 25 percent and the debt incurred increased 28 percent due to increased per acre farmland prices.

The Problem Statement

Oklahoma census data reveal that the average age of the Oklahoma farm operator increased from 51.7 years in 1969 to 52.6 years in 1974. In 1969, 45.1 percent of Oklahoma farm operators were 55 years of age and older and in 1974, this percentage had increased to 47.7 percent (16). However, farm operator data are not necessarily indicative of the age distribution of the farm landowner. With high land prices increasing financial requirements, there appears to be an increasing tendency among larger farm operators to own only part of the land resource base. This may suggest that in the future an increasing portion of the farmland will be owned by the nonoperator owner class (5).

At the beginning of this decade, U.S. farm real estate ownership was distributed among approximately 2,387,600 active farmer landowners and an estimated 871,000 nonoperator landlords (5). Despite the continuing decline in farm numbers and further consolidation of land into larger operating units, farmland ownership remains widely held.

The apparent chronological aging of current farm landowners suggests a need for current information regarding the age of farm landowners in Oklahoma. Data available for 1958, reveal that 77.5 percent of Oklahoma's landowners were 45 years of age or older. These data suggest the need for new landowners if the family farm is to remain the basic unit of production in agriculture.

Very little current evidence is available with respect to the age distribution of Oklahoma's landowners. Little is known about the landlords of Oklahoma's farmland. The potential availability of land for beginning farmers is also unknown. Little information is available regarding the extent of land transfer and resulting capital needs that may be anticipated in Oklahoma over the next decade. Useful information concerning the land ownership patterns of Oklahoma should be particularly useful to prospective farmers, lending agencies, tax officials, land-use planners, and policy makers, so that decisions can be made which are consistent with public and private goals and objectives.

Objectives

The specific objectives of this study are:

1. To determine the distribution of landowners in Oklahoma by legal form of ownership;
2. to determine the age distribution of individual Oklahoma landowners;
3. to estimate the amount of land available for transfer in the next decade;
4. to estimate the capital needed to finance anticipated land transfers;

5. to identify factors which suggest the future patterns of farmland ownership in Oklahoma.

Review of Literature

Previous research of land ownership patterns in Oklahoma is limited to two survey reports. The first survey, by Randall T. Klemme (6) in 1935, estimated the distribution of landowners as to class of ownership to evaluate the problems incurred by tax exempt and corporate ownership. His study indicates that of the 44,308,006 acres of land in Oklahoma, 84.4 percent was privately owned; 8.6 percent was non-urban tax exempt; 4.5 percent was owned by corporations; and 1.8 percent was unclassified as to ownership. Klemme noted that the highest proportion of private ownership occured in the southwestern cotton portion and in the north central cash grain and livestock area of the state.

Tax exempt ownership varied throughout the state and was broken roughly into two groups. The first and largest group consisted of land owned by federal, state, and local governments. The second group of tax exempt land was Indian tribal land alloted by headright.

The third class of ownership, corporately held land, was found primarily in eastern Oklahoma. The area consisted of large timber tracts owned by commercial lumber and paper corporations.

Klemme observed that there were several forces which determine the nature and extent of Oklahoma land ownership. Firstly, there was the original patent, whether the land was homesteaded or acquired through legal allotment. Secondly, the physical characteristics of the land limited the uses to which it could be employed. And the third force affecting land ownership, involved the social and economic characteristics

of any locality.

The second survey was a 1958 Great Plains State report conducted by Roger W. Strohbehn and Gene Wunderlich (13) of the Agricultural Research Service, United States Department of Agriculture. The survey was designed to discover the personal and legal characteristics of landowners and to reveal trends, if any, taking place in the ownership patterns within the ten Great Plains states: North Dakota, South Dakota, Nebraska, Kansas, Montana, Wyoming, Colorado, Texas, New Mexico, and Oklahoma. The basic data in the report were presented statistically and no attempt was made to analyze the data. The information was presented as an aid to research groups, both public and private, and to governmental agencies interested in policy formulation. The land ownership survey was a part of a larger research project which included land tenure, farm finance, and land market problems in the Great Plains States.

The Great Plains report listed landowner characteristics for individual states as well as for the entire region. L.E. Osborn (9) analyzed the data contained in the Great Plains survey to study ownership patterns as they applied to Oklahoma. From the information collected in the survey, Osborn analyzed the type and legal characteristics of ownership such as individuals, partnerships, and corporations. Personal characteristics such as occupational pursuits, entrepreneurial status, and age of land owner were also analyzed. Osborn also analyzed the method of acquisition and holding of the land, the distribution of cropland and grazing land by ownership type, the distribution of surface and subsurface rights, and a discussion on average size of ownership unit. Osborn's conclusions relate only to the state of Oklahoma and are

not considered applicable to the other Great Plains States.

U.S. and Oklahoma Census data deal only with farm operator characteristics and therefore are not directly related to farmland ownership patterns.

Thesis Organization

In Chapter II the methodology and procedure of the study are presented. A description of the study area and the classification of type-of-farming areas are presented. The method used in estimating landowner ages is also given.

The data obtained in the survey of 60 townships across Oklahoma are presented in Chapter III and the reliability of the data is discussed. The data includes form of land ownership and individual landowner age distributions in the five type-of-farming classifications. The relationships between the various type-of-farming areas and their respective landowner age distributions are analyzed. A comparison of the landowner age distributions between eastern, central, and western Oklahoma is made.

The estimated Oklahoma farm landowner age distribution is detailed in Chapter IV. Farm real estate transfer projections and the anticipated farmland capital and credit requirements for Oklahoma are also presented.

In Chapter V the study is summarized and the conclusions and implications are presented along with suggestions of future research needs.

CHAPTER II

METHOD AND PROCEDURE

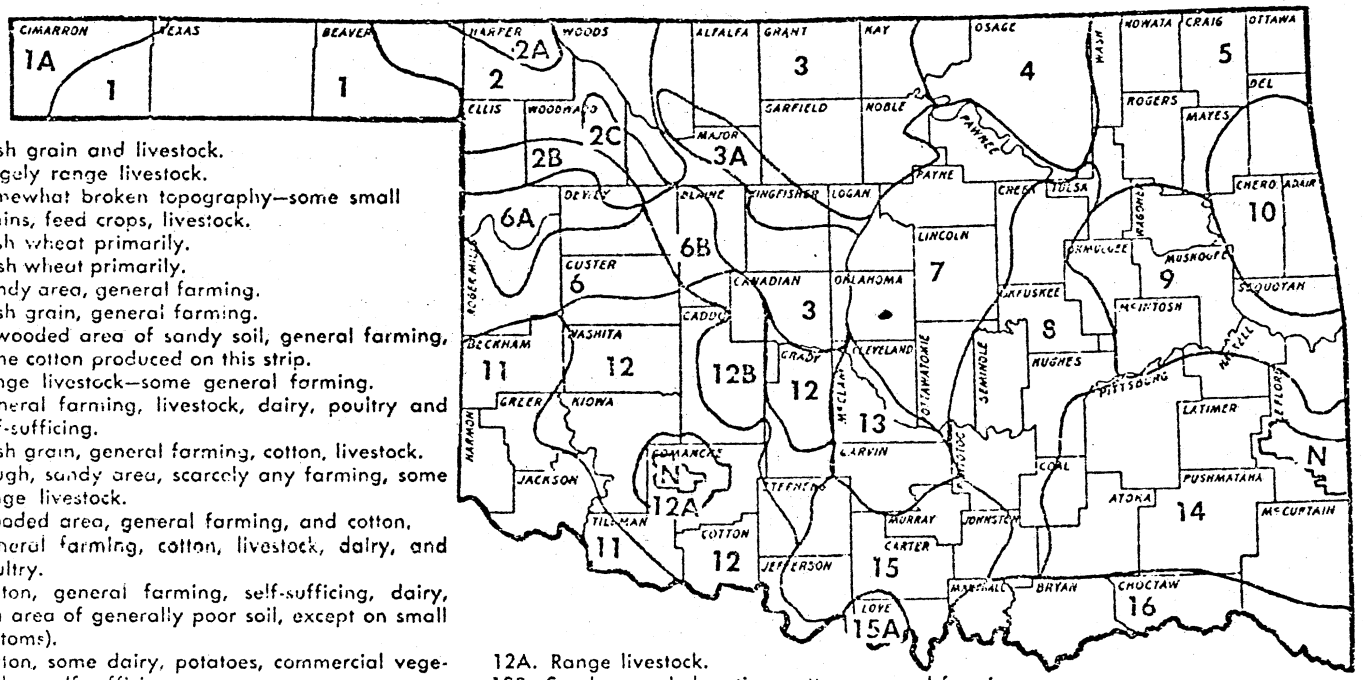
Introduction

The objective of the landowner survey was to provide an accurate estimate of the age of landowners in Oklahoma. The major constraints in any land ownership study are cost factors and time limitations. Thus, a sample was drawn to represent the vast universe of landowners in Oklahoma. The sampling procedure was designed to include all types of land and all forms of ownership.

The state was divided into type-of-farming areas and a random sample was drawn within each area. Each type-of-farming area was subdivided into congressional townships. The township was the sampling unit used. The size of the sample within each area was proportional to the size of the farming area. This procedure provided geographic dispersion and insured that all types of farmland in Oklahoma received proportional weight in the survey.

Land Classification by Type of Farming

The initial step of the survey was to divide the state into type-of-farming areas. Gray and Galloway (4) indicate that the major types of farming in Oklahoma included cash grain, cotton, livestock raising, and general farming (Figure 1). General and diversified farming are the rule rather than the exception in Oklahoma due to the wide variations



1. Cash grain and livestock.
1A. Largely range livestock.
2. Somewhat broken topography—some small grains, feed crops, livestock.
2A. Cash wheat primarily.
2B. Cash wheat primarily.
2C. Sandy area, general farming.
3. Cash grain, general farming.
3A. A wooded area of sandy soil, general farming, some cotton produced on this strip.
4. Range livestock—some general farming.
5. General farming, livestock, dairy, poultry and self-sufficing.
6. Cash grain, general farming, cotton, livestock.
6A. Rough, sandy area, scarcely any farming, some range livestock.
6B. Wooded area, general farming, and cotton.
7. General farming, cotton, livestock, dairy, and poultry.
8. Cotton, general farming, self-sufficing, dairy, (An area of generally poor soil, except on small bottoms).
9. Cotton, some dairy, potatoes, commercial vegetables, self-sufficing.
10. Some fruit, general farming, dairy and poultry, self-sufficing, (rough wooded land).
11. Cotton, supplemented with cash grain, livestock, dairy, and poultry.
12. Cotton, cash grain, livestock, some dairy and poultry.
12A. Range livestock.
12B. Sandy, wooded section, cotton, general farming.
13. Cotton, livestock, general farming, broomcorn.
14. Self-sufficing, cotton, livestock (rough, mountain and wooded area).
15. Range, livestock, general farming, self-sufficing.
15A. Cotton.
16. Cotton, general farming.

This type-of-farming map for Oklahoma does not show recent trends.

Figure 1. Type-of-Farming Map for Oklahoma

in climate, soils, and terrain.

To determine recent trends in types of farming for Oklahoma, data were obtained from the 1974 Preliminary Census of Agriculture (17) regarding "Land in Farms According to Use". These data are presented in Table I along with the major crops produced in each county.

The counties in Table I are ranked according to their harvested cropland as a percent of all land in the county. Total cropland for each county consisted of harvested cropland, cropland used only for pasture, and all other cropland. Counties with a percentage of harvested cropland acreage greater than the state average were classified as primarily crop growing counties. Other counties were classified as general farming areas.

Sharp lines cannot be drawn where one type of farming ceases and another begins. Some counties have a distinct division of farming type within the county. In these cases the classification was made on a township basis.

Evaluation of Table I indicates that there are five major types of farming in Oklahoma: Cash Grain, Cotton, Irrigation, Timber, and General Farming-Livestock. The crop growing counties were subdivided into Cash Grain, Cotton, and Irrigated areas. The general farming counties were subdivided into Timber and General Farming-Livestock. Figure 2 shows the type-of-farming areas designated for this survey.

Wheat is the number one cash crop in Oklahoma in terms of acres harvested and is grown on more farms than any other crop. Oats and barley are grown as feed crops and as winter pastures. The Cash Grain areas are the north-central area as well as Cotton, Wagoner, and Ottawa Counties (Table II). Ottawa and Wagoner Counties were classified as

TABLE I

AGRICULTURAL LAND USE AND MAJOR CROPS GROWN IN OKLAHOMA, BY COUNTY, 1974.

COUNTY	LAND IN FARMS[a]	CROPLAND HARVESTED	CROPLAND FOR PAST.	ALL OTHER CROPLAND	TOTAL CROPLAND	IRRIGATED LAND	WOOD-LAND	ALL OTHER LAND	HAR. %[e]	CATTLE& CALVES	WHEAT& SM. GR.	SOR-GHUM	PEA-NUTS	SOY-BEAN	COTTON
GRANT	601689	375275	47539	20576	443390	426	2985	155314	62.4	53656	358290	2906	0	0	0
ALFALFA	481806	298486	50201	5969	354656	2416	2506	124644	62.0	85480	275793	1090	0	350	0
TILLMAN	519168	305475	45832	26798	378105	13012	2713	138350	58.8	57178	216859	5115	0	0	65748
GARFIELD	646702	376835	75565	12457	464857	3413	5406	176439	58.3	73014	361696	510	0	120	0
KAY	504283	272806	47152	8384	328342	628	5409	170532	54.1	59361	247153	3783	0	557	0
WASHITA	620369	332156	80765	16909	429830	10979	9756	180783	53.5	74455	217589	14482	751	167	78441
KINGFISHER	575478	289560	77798	20953	379311	3485	10780	185387	48.8	99961	254050	1099	40	90	32
KIOWA	624323	300753	69955	25230	395938	5448	8220	220165	48.2	52456	228889	1851	139	565	56131
JACKSON	525044	237718	53870	59322	350910	36870	4039	170095	45.3	44491	167077	5923	572	70	53128
COTTON	353568	161047	50330	4788	216165	1165	4116	143287	44.3	47871	145662	1337	0	0	5768
BLAINE	528099	230029	56528	13756	300313	1487	26131	201655	43.6	72122	206877	3352	146	50	3516
CUSTER	617323	266191	60444	9510	336145	5457	9828	271350	43.1	68506	226215	5049	248	280	18717
CANADIAN	521693	223749	71110	10515	305374	5031	22410	193909	42.9	105486	185077	4066	417	1004	6402
NOBLE	410826	170381	49905	7761	228047	232	9866	172913	41.5	50146	149296	611	0	199	0
TEXAS	1169735	481158	53183	206771	741112	168006	7076	421547	41.1	174323	288372	104251	0	110	0
OTTAWA	212228	81326	43178	1991	126495	247	14112	71621	38.3	51061	18555	17308	0	20243	0
CADDO	757893	282137	104377	15926	402440	47707	46199	309254	37.2	131978	160971	20051	28909	672	33543
HARMON	302397	111343	50391	29124	190858	16585	6686	104853	36.8	28113	67698	3924	47	0	31137
GREER	364410	131402	40719	18379	190500	8337	5995	167915	36.1	28701	82883	1369	138	0	33583
MAJOR	543097	187415	55073	6197	248685	5247	31612	262800	34.5	60765	167494	2850	0	0	37
WAGONER	211822	68817	45056	4335	118208	187	24721	68893	32.5	42030	12942	3809	0	31327	406
WOODS	770634	246726	56470	10138	313334	2039	13096	444204	32.0	81510	229705	743	5	0	0
BECKHAM	500731	153888	62916	18538	235342	2816	11823	253566	30.7	48945	75264	9264	387	0	51031
BEAVER	1090064	331545	78223	78331	488129	21663	12082	589853	30.4	79304	269863	32192	0	0	0
LOGAN	335459	106759	57044	7761	171564	995	33595	150310	30.0	50088	86102	894	110	356	1101
STATE TOTAL	33348340	8922197	4682353	1066634	14651184	520328	2298233	16489419	26.8						
HARPER	625372	168650	34703	11956	215309	5205	12706	397357	26.8	77421	151330	1710	0	0	0
DEWEY	579605	147526	65416	8407	221349	1185	25991	332265	25.5	58439	129911	1736	0	0	2800
CIMARRON	1037244	262262	26821	141794	430877	60628	D	593677	25.3	75046	126822	101922	0	0	0
GRADY	600611	143365	111595	10513	265473	4763	24220	310918	23.9	115372	87866	5717	3306	565	12596
COMANCHE	409300	94981	55512	6597	157090	1830	12342	239868	23.2	58608	68814	1325	1734	62	4205
OKLAHOMA	238696	55158	47079	4783	107020	937	36814	94862	23.1	38438	33965	1526	496	308	472
MUSKOGEE	367547	84669	71516	8305	164490	1813	24886	178171	23.0	70663	9661	4574	501	28232	2602
ELLIS	722513	147864	67505	17746	233115	10423	13382	476016	20.5	67257	124073	3695	0	162	239
MAYES	246311	49939	60502	5125	115616	50	25597	105098	20.3	65139	7483	5107	0	6577	36
TULSA	183912	36563	52108	3609	92280	318	13331	78301	19.9	33709	7777	931	9	7547	76
WOODWARD	766309	151745	44292	17969	214006	4511	15666	536637	19.8	79132	126970	2262	0	0	15
CLEVELAND	156595	30795	44455	2063	77313	1329	16032	63250	19.7	31415	12066	1574	110	188	598
PAYNE	307945	55429	55852	3292	114573	910	25310	168062	18.0	56069	31683	1219	384	256	898
CRAIG	414180	74743	64824	8000	147567	131	12439	254174	18.0	95299	12046	11676	0	16384	0

Table I (Continued)

COUNTY	LAND IN FARMS[a]	CROPLAND HARVESTED	CROPLAND FOR PAST.	ALL OTHER CROPLAND	TOTAL CROPLAND	IRRIGATED LAND	WOOD-LAND	ALL OTHER LAND	HAR. %[e]	CATTLE& CALVES	WHEAT& SM. GR.	SOR-GHUM	PEA-NUTS	SOY-BEAN	COTTON
McCLAIN	313196	53605	63311	4748	121664	3341	8811	182721	17.1	67867	19435	2203	936	1886	5869
GARVIN	417242	69653	97632	5894	173179	4828	25549	214514	16.7	80738	22062	5368	1283	3953	2106
DELAWARE	235646	38539	63429	4204	106172	71	49663	80811	16.3	57864	5830	4182	0	2817	0
BRYAN	414307	67146	99551	10118	176815	8243	45058	193034	16.2	88733	6231	5756	13615	4419	1838
STEPHENS	444827	71181	80954	8111	160246	673	27719	256862	16.0	71369	43187	2726	2207	144	3193
POTTAWATOMIE	309281	47624	61197	7694	116715	4162	31436	152136	16.0	53009	14801	2447	3704	2223	187
PAWNEE	304289	48453	44134	2283	94870	150	26184	183235	15.9	53041	32905	863	0	215	188
OKMULGEE	279234	42987	52274	5111	100372	181	27583	151279	15.4	51029	3916	3633	1838	4740	344
SEQUOYAH	230921	34710	55563	4798	95071	1874	44304	91546	15.0	43528	1972	295	0	10591	535
ROGER MILLS	716908	107062	74327	13765	195154	5477	7870	513384	14.9	70475	67785	8843	0	334	9270
NOWATA	269670	39204	60209	7317	106730	2	11497	147443	14.8	47151	9180	3908	0	2208	0
ROGERS	281591	41167	47911	3975	93053	197	27093	161455	14.6	62614	10770	1213	0	4561	0
McINTOSH	232180	31969	57074	3463	92406	78	29090	110684	13.7	43594	1918	3585	1009	6455	318
LEFLORE	366020	50157	98424	5347	153928	998	75872	136220	13.7	77649	4031	532	32	15555	10
McCURTAIN	273492	36803	79312	3567	119387	354	59961	94144	13.3	68934	1434	1533	253	12469	1210
WASHINGTON	225425	29299	30290	2628	62217	1097	14448	148760	13.0	39769	7297	851	0	3154	0
LINCOLN	407661	52297	87369	7657	147323	554	54624	205714	12.8	69785	16957	1950	1239	268	63
HUGHES	340262	39997	62936	4603	107536	7472	77337	155389	11.8	57030	1412	2621	11720	5649	30
ADAIR	182034	21181	53783	3183	78147	1286	51290	52597	11.6	47797	395	224	0	60	0
OKFUSKEE	282321	31631	61810	4848	98289	1053	41377	142655	11.2	48415	5020	1940	2246	2264	100
LOVE	238372	24866	49957	7826	82649	2328	26031	129692	10.4	37515	2933	3300	4355	225	2524
HASKELL	252959	24826	65830	2437	93093	41	44444	115422	9.8	55078	1527	142	0	1975	0
CHEROKEE	240260	22990	55297	3251	81538	2388	73716	85006	9.6	46549	171	10	0	90	0
SEMINOLE	239768	22073	56877	4126	83076	1054	35593	121099	9.2	41945	2778	688	1744	1293	10
JEFFERSON	422799	38423	62348	4398	105169	502	7882	309748	9.1	63566	20784	735	378	0	5004
CHOCTAW	285509	25406	69065	3445	97976	642	51485	136048	8.9	78214	459	96	730	1467	87
POTTOTOC	350406	29274	65094	2205	96573	1233	30605	223228	8.4	64092	1352	507	650	59	335
COAL	269495	22223	42320	846	65389	85	39187	164919	8.2	56280	502	1707	176	0	653
MURRAY	212920	16959	35072	1326	53357	948	5775	153788	8.0	37789	3919	626	50	663	32
MARSHALL	185356	14550	30043	3483	48076	1665	14010	124270	7.8	30906	1732	1892	2759	82	313
ATOKA	371062	27384	74278	5992	107654	1724	56019	208189	7.4	74118	196	581	4193	336	158
JOHNSTON	304005	22227	48355	2076	72658	2145	21659	209688	7.3	55175	734	1773	3386	514	383
CARTER	305567	20724	68531	2565	91820	1683	30930	182817	6.8	51366	4702	438	725	342	175
CREEK	318732	21263	67394	3291	91948	795	74111	152673	6.7	46510	3129	716	632	760	10
OSAGE	1228224	63442	72294	8018	143754	988	115848	968622	5.2	174956	32040	1924	0	1458	230
PITTSBURG	560715	28291	98194	4695	131180	941	112287	317248	5.0	87735	2224	1520	2452	1578	11
PUSHMATAHA	327608	15236	46807	1238	63281	212	92125	172202	4.7	49042	0	15	270	0	0
LATIMER	243185	9794	37303	1494	48591	972	38213	156381	4.0	31998	1052	317.	2	31	0

[a]All columns represent acres except Cattle and Calves (Head).

[e]Harvested cropland as a percent of land in farms.

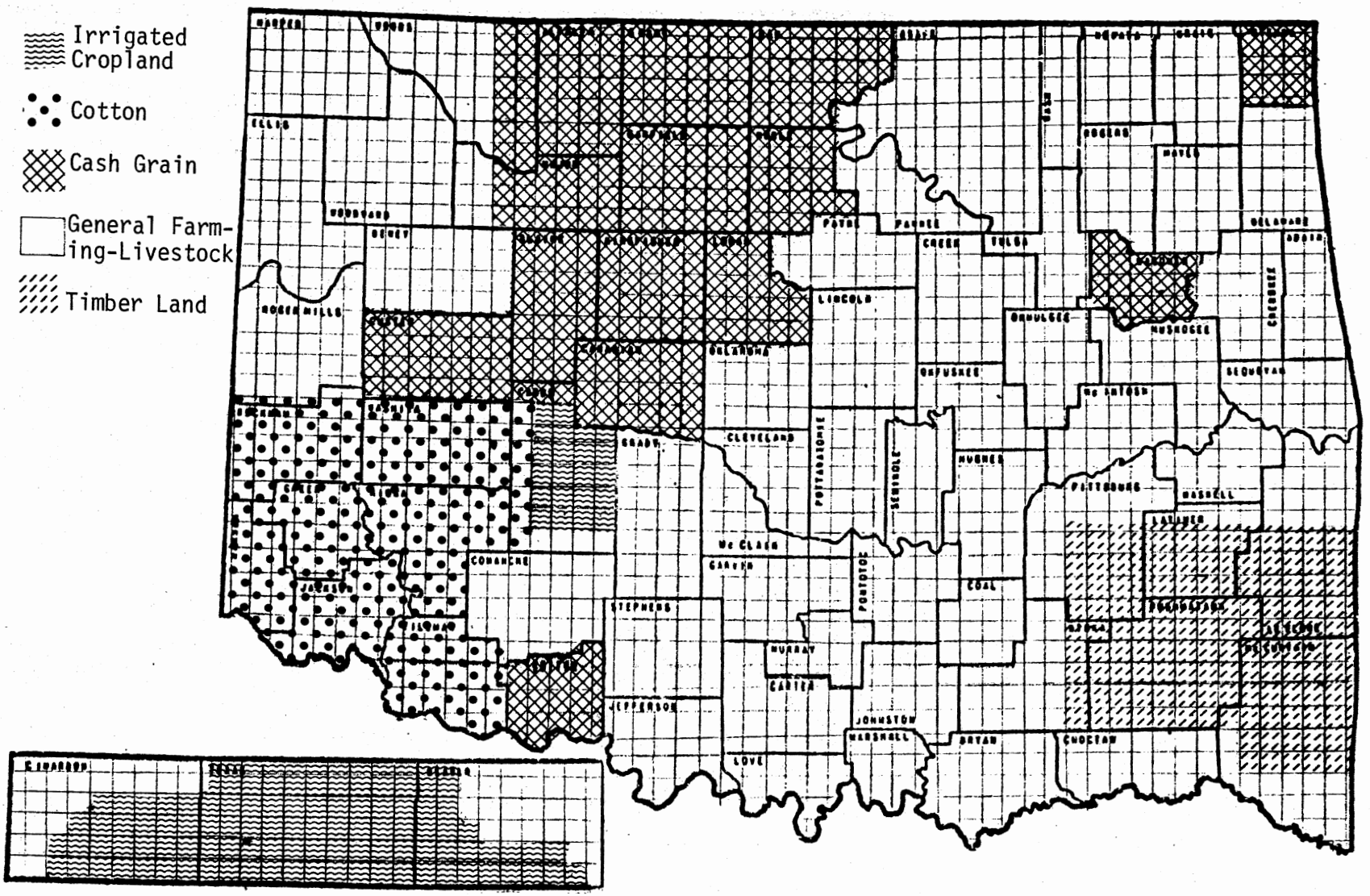


Figure 2. Designated Type-of-Farming Areas of Study

Cash Grain cropland counties because of their large soybean acreages. As a result of the wide dispersion of small grain acreage across the state, the fifteen Cash Grain counties accounted for only 48.06 percent of the small grain acreage in Oklahoma.

TABLE II

CASH GRAIN COUNTIES IN THE STUDY AREA

County	Land in Cash Grains[1]	Land in Farms	Cash Grain Land as Percent of Land in Farms
Garfield	363465	646702	56.20
Grant	358290	601689	59.55
Alfalfa	275793	481806	57.24
Kingfisher	254135	575478	44.16
Kay	247239	504283	49.03
Woods	229854	770634	29.83
Custer	226601	617323	36.71
Blaine	206943	528099	39.19
Canadian	185694	521693	35.59
Major	167494	543097	30.84
Noble	149578	410826	36.41
Cotton	145662	363568	40.06
Logan	86102[2]	355469	24.22
Ottawa	18906[3]	212228	8.91
Wagoner	13220[4]	211822	6.24
total	2928976	7344717	
Oklahoma	6094283		

[1]includes wheat, barley, oats, and corn.

[2]20,243 acres of soybeans not included.

[3]31,327 acres of soybeans not included.

[4]48.06% of cash grain acreage in Oklahoma.

Formerly, cotton was produced in most eastern Oklahoma counties and all along the southern border of the state. The Cotton area has decreased greatly in the past 50 years, due to soil depletion problems and economic reasons. The primary cotton producing area of the state is now in the far western counties south of the Canadian River. Eight counties were classified as cotton producing areas and they accounted for 80.78 percent of the cotton acreage in Oklahoma in 1974 (Table III). Custer County was the only county with any significant cotton acreage omitted from the Cotton classification. Custer County had 18,717 acres, or 3.03 percent of it's total acreage in cotton, but this was overshadowed by 226,601 acres of small grain acreage which placed it in the Cash Grain category.

TABLE III

COTTON COUNTIES IN THE STUDY AREA

County	Land in Cotton	Lands in Farms	Cotton Land as Percent of Land in Farms
Washita	78,441	620369	12.64
Tillman	65,748	519168	12.66
Kiowa	56,131	624323	8.99
Jackson	53,128	525044	10.12
Beckham	51,031	500731	10.19
Greer	33,583	364410	9.22
Caddo	33,543	757893	4.43
Harmon	31,137	302397	10.3
total	402,742*	4214335	
Oklahoma	498,515		

*80.78% of cotton acreage in Oklahoma

Irrigation is used most heavily in the Panhandle and southwestern counties. Sections of four counties were classified as primary irrigation areas (Table IV) and included 47.27 percent of the irrigated cropland in Oklahoma. Jackson County, with 36,870 acres of irrigated land was a significant exclusion from the Irrigation area, but it's 53,128 acres of cotton support it's classification as a Cotton area.

TABLE IV

IRRIGATED COUNTIES IN THE STUDY AREA

County	Irrigated Land	Land in Farms	Irrigated Land as Percent of Land in Farms
Texas	168006	1169735	14.36
Cimarron	60628	1037244	5.85
Caddo	47707	757893	6.29
Beaver	21663	1090064	1.99
total	298004[1]		
Oklahoma	520348		

[1] 47.77% of irrigated land in Oklahoma.

The Timber area is located in extreme southeastern Oklahoma and includes portions of the soil classification referred to as the Forrested Coastal Plains and Ouachita Highlands (4). This is an area of rugged topography, mountain ridges, and narrow valleys. Commercial forests are dominant in the area and cattle are raised on small acreages cleared of brush and timber.

General Farming-Livestock, the fifth type-of-farming area, includes the largest amount of acreage with roughly 20.2 million acres or 45.9 percent of the land in Oklahoma (4). General farming is prevalent over the entire state, but the eastern one-half and northwestern counties were classified as the primary general farming livestock raising areas of Oklahoma.

Native hay is an important crop in eastern Oklahoma and large quantities are harvested for both local use and sale outside the area. Much of the rangeland acreage has been improved with fescue, bermuda grass, and bromegrass. Alfalfa hay is widely used by local cattlemen as well as many tons being shipped to other prairie states in high rainfall years.

Oklahoma produces several other important crops. Grain sorghums and peanuts are well adapted to areas with sandy soils. Soybeans are increasing in use and are raised to some extent in eastern Oklahoma. Peaches, plums, apples, and strawberries are the more common fruits and are grown mostly in the east along with truck crops like green beans, sweet corn, and melons.

Elimination of Metropolitan Areas

The objective of this survey was to estimate the age of farmland owners in Oklahoma. Therefore, densely populated, non-agricultural areas were not considered relevant and were eliminated from the survey population.

It appears reasonable to assume that most city workers live within thirty miles of their place of employment and that this area could be considered largely non-agricultural. Thus, all land within a thirty

mile radius of the state's four metropolitan areas were excluded from the survey population before the sample was drawn. These four cities include Lawton, Oklahoma City, Tulsa, and Fort Smith, Arkansas. The possibility of a metropolitan township appearing in the sample is thus removed.

Determination of Township Population

The number of townships in each of the four type-of-farming areas were determined by numbering each complete, non-metropolitan township. A complete township was considered to consist of approximately 23,040 acres, as opposed to a partial township such as those along the state border. The complete townships were numbered in order in each type of farming area from north to south, west to east, on a state of Oklahoma congressional township map. The numbering of the townships allowed the sample to be drawn through the use of a table of random numbers. The population consisted of 875 General Farming-Livestock townships, 264 Cash Grain townships, 143 Cotton townships, 127 Timber townships, and 113 Irrigation townships.

Sample Size

Due to time and cost limitations a township sample size of 60 was deemed feasible. The sample size is 3.94 percent of the population and is considered adequate to make a reliable estimate of the population. The sample size within each farming area is proportional to the total number of townships in that area. Thus, if thirty percent of the state consists of a particular farming type, then thirty percent of the sample is derived from this farming type area. This procedure

permits the same degree of reliability from each type-of-farming area. The sample size in each type-of-farming area is given in Table V.

TABLE V

SAMPLE SIZE BY FARMING AREA

Type-of-Farming Area	Total Number of Townships in Study Area	Percent of Total Study Area	Sample Size Per Area
General Farming-Livestock	875	57.49 X 60	35
Cash Grain	264	17.35 X 60	10
Cotton	143	9.40 X 60	6
Timber	127	8.34 X 60	5
Irrigated Cropland	113	7.42 X 60	4
Total	1522	100.00	60

The townships corresponding to the 60 random numbers drawn are included in the sample and are shown in Figure 3. Each township within a type-of-farming area had the same probability of being selected.

Estimation of Landowner Age

After the sample townships were selected, each landowner of record within each of the townships was identified. Landowners of record in most townships also included corporations, estates, trusts, and tax

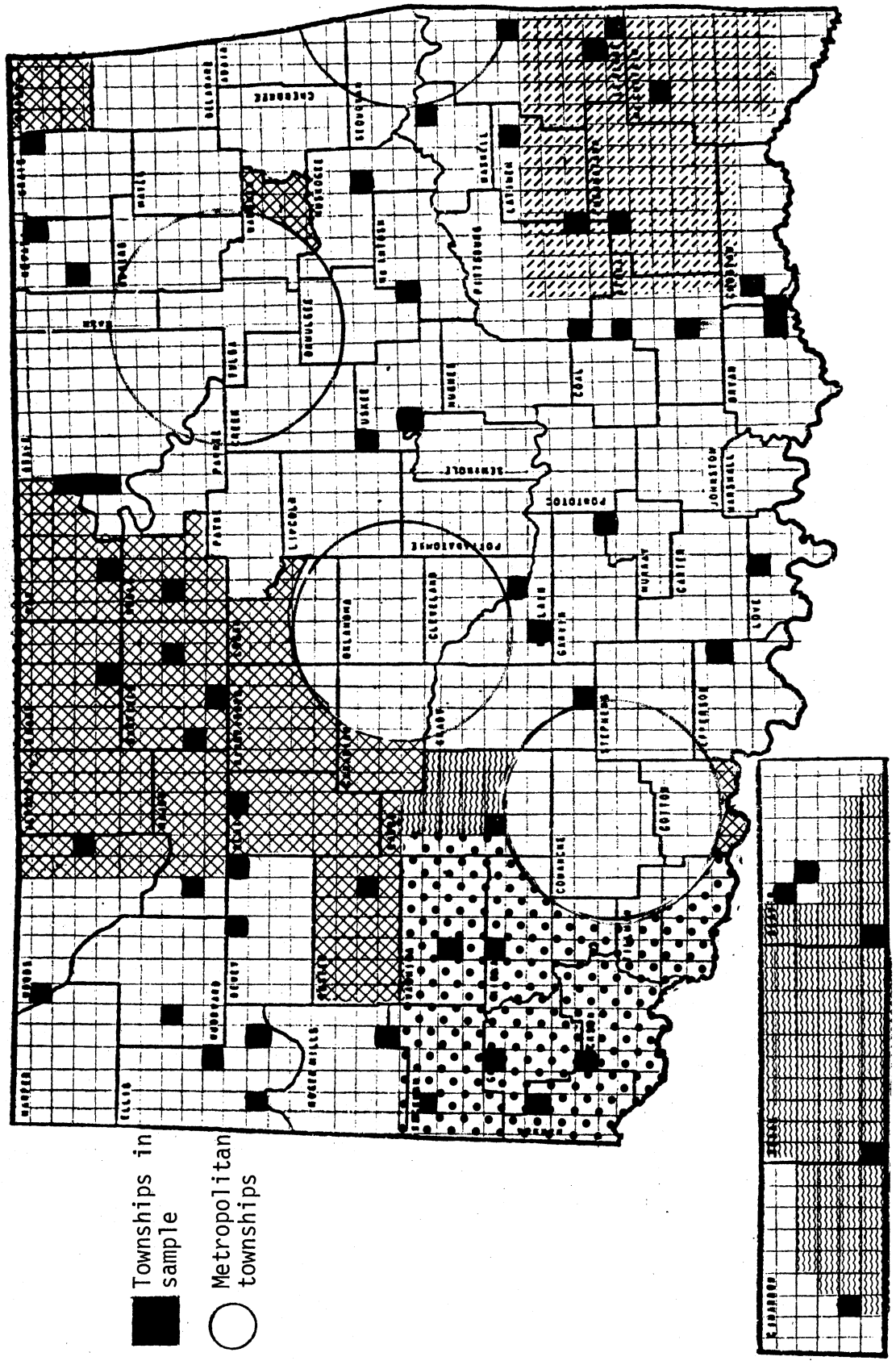


Figure 3. Sample Townships Included in Survey

exempt lands. Tax exempt lands were divided into two groups. The first is land owned by federal, state, and local government such as the Ouachita National Forest, the Kaw Lake Reservoir, and the Oklahoma School Land Commission holdings. The second group consisted of Indian tribal lands allotted by headright (BIA). The names of landowners were obtained either through records of the county clerk or from land ownership maps furnished by mapping companies.

One to several individuals, depending on the density of landowners, were selected within each township whose long residence allowed them to provide estimates of the ages of landowners in their respective township. The individuals were selected on the basis of recommendations received from their county clerk, county assessor, business associates, postmaster, and fellow neighbors. These individuals were usually farmers or ranchers who had owned land and lived in the area all of their life. They were active in farm organizations and in community activities and had a thorough knowledge of the people living around them.

Individuals selected in each township were contacted personally and asked to estimate the ages of their neighboring landowners within one of the following six age categories:

(1) 25 years of age and under

(2) 26-34

(3) 35-44

(4) 45-54

(5) 55-64

(6) 65 years of age and over.

When sample data are used to represent a population, it is important to determine the degree to which the sample represents the population. Initially, four individual landowners of record per township were selected at random and sent questionnaires asking them to indicate their appropriate age category (Appendix A). Questionnaires returned were used to compare the estimated age category received in the survey with the age category reported by the landowners responding to the questionnaire. The results of this comparison are presented in Chapter III.

CHAPTER III

ANALYSIS OF THE DATA

In this chapter the reliability of the data collection method is discussed. This is followed by a description of the land distribution by form of ownership. The land distribution by age of individual landowner is presented along with a discussion of the relationship between landowner age categories within each type-of-farming area. The relationships between the various type-of-farming areas and their respective landowner age distributions is also analyzed. Lastly, a comparison of the landowner age distributions between eastern, central, and western Oklahoma is made.

Reliability of Data Collection Method

Every survey contains some uncertainty as to the possible bias entering the procedure used to obtain the information. Did the respondents provide an accurate estimate of the landowner's age? Did the resulting percentage distribution of owners provide an accurate picture of the current land ownership situation in Oklahoma? To partially answer these questions, the Chi-square test of homogeneity was employed to statistically compare the mail questionnaire landowner ages with the peer estimates received in the survey (18). Of the 240 questionnaires mailed, a total of 111 were returned for a 46.3 percent response rate.

The Chi-square test of homogeneity permits the researcher to systematically compare the two samples. For purposes of constructing the test, the null hypothesis is stated as: The two samples represent different populations. The resulting Chi-square value (X^2) is 1.56. This suggests that there are 954 chances in 1000 that the disparity found between the observed frequencies could have arisen solely from sampling errors. Therefore, the null hypothesis that the two samples represent different populations is rejected.

Land Distribution by Form of Ownership

The legal forms of ownership of Oklahoma's farm and ranch land are widely varied. Land is held by individuals, corporations, government, trusts, Bureau of Indian Affairs (BIA), and estates. There are approximately 33 million acres of land in farms in Oklahoma (16). The form of ownership was identified for 1,175,511 acres, or 3.55 percent of the land in farms. Individual ownership was predominant with 914,298 acres or 77.8 percent of the sample. The survey data are presented in Table VI according to type-of-farming area and form of ownership.

Irrigated Cropland Farming Area

The irrigated farmland of Oklahoma consists of roughly 520,000 acres (16). Four townships were selected at random to represent the Irrigation type-of-farming classification. One township came from each of Beaver, Cimarron, Texas, and Caddo Counties. In these four townships, the form of ownership was identified for 88.8 percent of the land.

Private individuals owned 72.6 percent of the acreage in the

TABLE VI

LAND DISTRIBUTION BY FORM OF OWNERSHIP AND TYPE OF FARMING, 60 OKLAHOMA TOWNSHIPS, 1977.

Area	Individ.	Estate	Trust	Corp.	BIA	Gov't	Total Acreage Identified	Unknown	Total Acreage in Sample
				Acreage Owned					
Irrigation	59,400	7,520	0	2,080	5,880	6,960	81,840	10,320	92,160
Cotton	111,060	8,560	160	0	0	4,200	123,980	14,260	138,240
Cash Grain	180,637	13,240	0	6,380	2,680	9,000	211,937	18,463	230,400
Timber	23,670	2,450	0	43,390	0	22,365	91,875	23,325	115,200
Gen. Farming-Livestock	539,531	48,338	10,180	6,980	4,330	56,520	665,879	140,521	806,400
60 Townships	914,298	80,108	10,340	58,830	12,890	99,045	1,175,511	206,889	1,382,400
				Percent of Land Owned[1]					
Irrigation	72.58	9.19	0	2.54	7.19	8.50	100.00	11.20	
Cotton	89.58	6.90	.13	0	0	3.39	100.00	10.30	
Cash Grain	85.23	6.25	0	3.01	1.26	4.25	100.00	8.01	
Timber	25.75	2.67	0	47.23	0	24.34	100.00	20.25	
Gen. Farming-Livestock	81.01	7.26	1.53	1.05	.65	8.49	100.00	17.43	
60 Townships	77.78	6.80	.88	5.00	1.10	8.43	100.00	14.97	

[1] Column "Unknown" is expressed as a percent of the "Total Acreage in Sample".

Irrigation classification sample. The remaining acreage consisted of 9.2 percent held in estates, 7.2 percent held by the Bureau of Indian Affairs (BIA), 8.2 percent government owned, and 2.5 percent in corporate ownership. The entire 5,880 acres of BIA land in the irrigation sample was located in Township 7 North, Range 12 West of the Indian Meridian in Caddo County, primarily along the Washita River. This acreage accounted for 25.5 percent of the land in this particular township and 45.6 percent of the BIA land found in 60 townships across the state.

Cotton Farming Area

Townships from Harmon, Beckham, Greer, Washita, Kiowa, and Jackson-Greer Counties comprised the sample for the Cotton type-of-farming area. In the 3.3 million acre Cotton area, 138,240 acres were sampled of which 123,980 acres were identified as to ownership form.

Individual ownership was predominant in this area, accounting for 89.6 percent of the acreage. Estates held 6.9 percent of the acreage, leaving only 3.5 percent in trusts and government ownership. There was no corporate or BIA land ownership in the Cotton area sample.

Cash Grain Farming Area

The Cash Grain area was primarily the north-central portion of Oklahoma and consisted of approximately 6.1 million acres. Three townships in Garfield County, plus one each from Kay, Custer, Noble, Woods, Blaine, and Grant Counties, and one township on the Kay-Osage County line made up the Cash Grain area sample. The form of ownership was identified for 91.99 percent of the 230,400 acre sample. This was the

highest percent of ownership form identification by type-of-farming area.

The Cash Grain area was very similar in percentage distribution to the Cotton type-of-farming area. In the Cash Grain area, there was 85.2 percent of the acreage in individual ownership and 6.3 percent in estates. Government ownership consisted of 4.3 percent, corporate ownership accounted for 3.0 percent, and 1.3 percent of the land was placed in the BIA category.

The majority of the government owned land, 5,880 acres, was located in Township 27 North, Range 5 East of the Indian Meridian in Kay and Osage Counties where the Kaw Lake Reservoir project resulted in government ownership of substantial acreage. A large amount of BIA land was also located in Kay and Osage Counties. 2,340 acres of Osage Indian Tribal land was located in Township 25 North, Range 1 East of the Indian Meridian in Kay County.

Timber Area

The 2.9 million acre Timber area is located in the heavily wooded, mountainous, southeastern section of Oklahoma. The five sample townships located in McCurtain, Pushmataha, Latimer-Pittsburg, and southern Leflore Counties consisted of 115,200 acres of which 91,875 acres were identified as to form of ownership.

The Timber area is drastically different than the other type-of-farming areas in land ownership distribution. Corporations owned 43,390 acres, or 47.23 percent of the acreage identified as to the form of ownership in this area. This high percentage of corporate ownership is due to the extensive lumbering activities in the area. Of all the

corporate owned land located in the 60 township sample 73.8 percent was found in these five townships.

The two Leflore County townships were located partially in the Ouachita National Forest. This accounts for the fact that 24.3 percent of the land in the sample was government owned.

Individual owners accounted for only 25.8 percent of the acreage, which is well below the 60 township sample average of 77.8 percent. Absentee ownership appears to be high in the area. Thus, 23,325 acres, or 20.3 percent of the Timber area sample acreage, was owned by people whose ages could not be determined. These landowners live out of the immediate area, many have out-of-state addresses.

General Farming-Livestock Area

The General Farming-Livestock (GFL) counties consisted of the eastern one-half of the state with the exception of Ottawa, Wagoner, and the extreme southeastern counties plus northwestern Oklahoma. There is approximately 20.2 million acres of land classified under the GF-L category of which 806,400 acres were sampled. The form of ownership was identified for 757,754 acres.

Land ownership in the GF-L area was dominated by individual ownership with 81.01 percent. Other significant forms of ownership included 8.49 percent in government ownership and 7.26 percent held by estates.

Land Distribution by Age of Individual Landowner

The remainder of this chapter focuses on individually owned land, since this is the only acreage for which farm real estate transfers will be projected. Age estimates for non-individual landowners such as

government and corporations are not relevant and therefore farmland transfers are not estimated for these categories.

Landowner age estimates were obtained for 914,298 acres of individually owned land. This acreage is divided by age category and presented by type-of-farming area in Table VII. Of the individually owned land in the sample 65.69 percent was owned by people 55 years of age and older compared to only 34.31 percent owned by persons 54 years and younger. Landowners 55 years of age and older were predominant in all type-of-farming areas except in the Timber area. The Timber area was the only area where landowners 54 years and younger held more acreage than those over 55 years of age. However, the Timber area is dominated by corporate and government ownership. The 23,670 acres of individually owned acreage was too small to determine an accurate individual landowner age distribution. The area had an abnormally large amount of acreage in the 35-44 years of age category due to the very large land ownership of one individual.

There was no distinguishable difference between the patterns of individual land ownership among the non-timber type-of-farming areas. Landowner acreage holdings increased successively with each higher age category level. In the Irrigated Cropland area landowners over 55 held 79.09 percent of the land. This was the largest percentage of acreage held by owners over 55. It also had the lowest percentage held by owners 44 years of age and younger with 3.44 percent.

The relationship between landowner age categories within each type-of-farming area was measured by using Duncan's multiple range test with the results presented in Table VIII (1). Initially, the percentage of total acreage per age category is calculated for each sample township.

TABLE VII

LAND DISTRIBUTION BY AGE OF INDIVIDUAL LANDOWNER AND TYPE OF FARMING, 60 OKLAHOMA TOWNSHIPS, 1977.

Area	25 and Under	26-34	35-44	45-54	55-64	65 and Over	Total	54 and Under	55 and Over
				Acreage Owned					
Irrigation	40	480	1,520	10,380	11,860	35,120	59,400	12,420	46,980
Cotton	640	3,120	6,560	14,467	35.387	50,886	111,060	24,787	86,273
Cash Grain	2,150	3,360	17,230	32,927	41,400	83,570	180,637	55,667	124,970
Timber	90	500	9,115	2,860	8,060	3,045	23,670	12,565	11,105
Gen. Farming-Livestock	5,550	14,450	57,620	129,255	129,742	202,914	539,531	206,875	332,656
60 Townships	9,110	21,430	93,895	189,244	226,844	373,775	914,298	313,679	600,619
				Percent of Land Owned					
Irrigation	.07	.81	2.56	17.47	19.97	59.12	100.00	20.91	79.09
Cotton	.58	2.81	5.91	13.03	31.86	45.82	100.00	22.33	77.68
Cash Grain	1.19	1.86	9.54	18.23	22.92	46.26	100.00	30.82	69.18
Timber	.38	2.11	38.51	12.08	34.05	12.86	100.00	53.08	46.91
Gen. Farming-Livestock	1.03	2.68	10.68	23.96	24.05	37.61	100.00	38.35	61.66
60 Townships	1.00	2.34	10.27	20.70	24.81	40.88	100.00	34.31	65.69

TABLE VIII

DUNCAN'S MULTIPLE RANGE TEST FOR TYPE OF FARMING VARIABLE BY AGE CATEGORY [1]

Type-of-Farming	Grouping[2]	Mean[3]	Age Category[4]
Irrigation:	DF=18 MS=118.419	n=4	
	A	59.120	6
	B	20.635	5
	C B	16.810	4
	C	2.610	3
	C	.755	2
	C	.070	1
Cotton:	DF=30 MS=117.291	n=6	
	A	43.733	6
	A	32.217	5
	B	14.538	4
	C B	5.912	3
	C B	2.983	2
	C	.617	1
Cash Grain:	DF=54 MS=51.639	n=10	
	A	43.835	6
	B	24.226	5
	B	17.884	4
	C	9.042	3
	D	1.807	2
	D	1.206	1

TABLE VIII (Continued)

Type-of-Farming	Grouping	Mean	Age Category
Timber:	DF=24 MS=740.09 n=5		
	A	44.510	5
	B A	30.186	3
	B A	12.558	4
	B A	10.508	6
	B	1.732	2
	B	.506	1
General Farming-Livestock:	DF=204 MS=98.234 n=35		
	A	37.731	6
	B	24.088	4
	B	23.972	5
	C	10.617	3
	D	2.607	2
	D	.985	1

[1]Alpha level = .05

[2]Means with the same letter are not significantly different.

[3]Percentage of total acreage per age category for each sample township.

[4]
1 25 and under
2 26-34
3 35-44
4 45-54
5 55-64
6 65 and older.

The means for each age category, the error mean square, and error degrees of freedom were then determined for each type-of-farming area. The Duncan test involves arranging the means in order from largest to smallest and those means that are significantly different are determined.

The Duncan test results are slightly different for each type-of-farming area, but in general the older landowner age categories have significantly larger percentage acreage means than the younger landowner age categories. Regardless of type-of-farming area, percentage acreage means for age categories 25 and under and 26-34 were not significantly different. Irrigated Cropland, Cash Grain, and General Farming-Livestock each had percentage acreage means for the 45-54 and 55-64 landowner age categories that were not significantly different, but in each, the 65 and over category was significantly different than all other age categories. The Timber area had the most uniform distribution of acreage by age categories with all but the 55-64 age category having similar means.

Landowner Age Distribution by Type of Farming

The individual farmland acreage has been classified by landowner age category and by type-of-farming area. Farm real estate transfers can be projected for each type-of-farming area. However, farmland transfers can be projected on a state basis, if all type-of-farming areas in the state have similar landowner age distributions. The relationship between the various type-of-farming areas and their respective landowner age distributions were analyzed using Duncan's multiple range test. The percentage acreage means of the various type-of-farming areas are contrasted for each particular age category

(Table IX).

The Duncan test reveals acreage percentage means for landowner age categories 25 and under, 26-34, and 45-54 are not significantly different regardless of the type-of-farming area. Percentage means for landowner age categories 35-44 and 55-64 are similar for all type-of-farming classifications except Timber land. The remaining landowner age category, 65 and over, had acreage percentage means which were similar with at least two other types of farming with the exception of the Timber land classification.

The Timber land sample area had large acreage totals in age categories 35-44 and 55-64 and a small acreage total in the 65 and over category due to the influence of a few very large landowners. Due to the dissimilarity of acreage percentage means of the Timber area with respect to other types of farming in Oklahoma, the five Timber area sample townships are not considered for purposes of projecting Oklahoma farm real estate transfers.

Landowner Age Distribution by Area of State

Landowner age distributions for central, eastern, and western Oklahoma were analyzed to discern any definite ownership patterns between areas of the state. The percentage acreage means per landowner age category were calculated for the three areas of Oklahoma. Duncan test results reveal that all age categories except 35-44 and 65 and over are similar regardless of the area of the state (Table X). In the 35-44 and 65 and over age categories the eastern area of Oklahoma has a percentage mean different from the other two areas. This is a result of the abnormal landowner age distribution of the Timber land area in southeastern Oklahoma previously discussed.

TABLE IX

DUNCAN'S MULTIPLE RANGE TEST FOR AGE VARIABLE BY TYPE OF FARMING AREA [1]

Age Category	Grouping [2]	Mean	N	Type of Farming Area
25 and under:		DF = 55	MS = 3.054	
	A	1.206	10	Cash Grain
	A	.985	35	General Farming-Lvstk.
	A	.617	6	Cotton
	A	.506	5	Timber
	A	.070	4	Irrigation
26-34:		DF = 55	MS = 7.259	
	A	2.983	6	Cotton
	A	2.607	35	General Farming-Lvstk.
	A	1.807	10	Cash Grain
	A	1.732	5	Timber
	A	.755	4	Irrigation
35-44:		DF = 55	MS = 169.157	
	A	30.186	5	Timber
	B	10.617	35	General Farming-Lvstk.
	B	9.042	10	Cash Grain
	B	5.912	6	Cotton
	B	2.610	4	Irrigation
45-54:		DF = 55	MS = 134.926	
	A	24.088	35	General Farming-Lvstk.
	A	17.884	10	Cash Grain
	A	16.810	4	Irrigation
	A	14.538	6	Cotton
	A	12.558	5	Timber

TABLE IX (Continued)

Age Category	Grouping[2]	Mean	N	Type of Farming Area
55-64:		DF = 55	MS = 307.81	
	A	44.510	5	Timber
	B A	32.217	6	Cotton
	B	24.226	10	Cash Grain
	B	23.972	35	General Farming-Lvstk.
	B	20.635	4	Irrigation
65 and over:		DF = 55	MS = 218.534	
	A	59.120	4	Irrigation
	B A	45.835	10	Cotton
	B A	43.733	6	Cash Grain
	B	37.731	35	General Farming-Lvstk.
	C	10.508	5	Timber

[1]Alpha level = .05

[2]Means with the same letter are not significantly different.

TABLE X

DUNCAN'S MULTIPLE RANGE TEST FOR AGE VARIABLE BY AREA OF STATE[1]

Age Category	Grouping[2]	Mean	N	Area of State
25 and Under:		DF = 57	MS = 3.031	
	A	.983	14	Central
	A	.917	24	Western
	A	.785	22	Eastern
26-34:		DF = 57	MS = 7.281	
	A	2.754	14	Central
	A	2.275	24	Western
	A	2.080	22	Eastern
35-44:		DF = 57	MS = 184.376	
	A	16.362	22	Eastern
	B A	10.086	14	Central
	B	6.571	24	Western
45-54:		DF = 57	MS = 139.703	
	A	23.768	22	Eastern
	A	22.012	14	Central
	A	17.005	24	Western
55-64:		DF = 57	MS = 330.43	
	A	29.379	22	Eastern
	A	24.741	14	Central
	A	24.456	24	Western
65 and over:		DF = 57	MS = 231.805	
	A	48.776	24	Western
	A	39.425	14	Central
	A	27.625	22	Eastern

[1]Alpha Level = .05

[2]Means with the same letter are not significantly different

CHAPTER IV

PROJECTIONS

The results of the Chi-square test of homogeneity suggest that the sample data adequately represent the universe of farm and ranch landowners in Oklahoma. Therefore, the sample survey data provide a basis for estimating the Oklahoma farmland and ownership age distribution.

In this chapter, the estimated Oklahoma farm landowner age distribution is compared with the 1974 Census of Agriculture Oklahoma farm operator age distribution. Farm real estate transfers are then projected on the basis of the Oklahoma farm landowner age distribution. Associated Oklahoma farm real estate capital and credit requirements are then presented for the next 10 years.

Estimated Oklahoma Farm Landowner Distribution

Form of Ownership

There are 33,082,848 acres of land in farms in Oklahoma according to the 1974 Census of Agriculture (16). The farmland acreage within each form of ownership category is estimated from the percentage distribution determined in the 60 township land ownership survey. The survey results reveal that the private individual is the predominant owner of Oklahoma farm and ranch land with 25.7 million acres. Local, state, and national government owned 2.8 million acres, just slightly above estates with 2.3 million acres. Table XI shows the estimated

acreage distribution of Oklahoma farmland by form of ownership.

TABLE XI

LAND DISTRIBUTION BY FORM OF OWNERSHIP, ESTIMATED STATE TOTAL, 1977.

Category	Sample Acreage Distribution	Percent	Estimated Oklahoma Acreage Distribution
Individuals	914,298	77.78	25,731,432
Estate	80,108	6.80	2,254,510
Trust	10,340	.88	291,002
Corporate	58,830	5.00	1,655,675
BIA	12,890	1.10	362,768
Government	99,045	8.43	2,787,461
total	1,175,511	100.00	33,082,848

Individual Landowner Distribution

The results of the Duncan multiple range test verifies that the individual land ownership distribution is statistically equivalent for all types of farming and areas of Oklahoma except for the Timber land area. Thus, one can assume, with the exception of the Timber area, that regardless of the type-of-farming or area of Oklahoma, the availability of farmland for transfer will be approximately the same over the state. Therefore, the expansion of the sample data to a state individual landowner distribution does not include the five Timber area townships. The omission of the Timber area sample townships results

in a 23,670 acre decrease in the individual landowner category and a 91,875 acre decrease in the survey acreage totals. These reductions increased the percentage of individually owned land considered from 77.78 to 82.19 percent. The Oklahoma individually owned land was therefore estimated by taking 82.19 percent of the 33,082,848 acres of land in farms in Oklahoma. This acreage total is divided according to age of landowner by using the percentage distribution of the 55 township sample. The distribution of Oklahoma land in farms by age of individual landowner is presented in Table XII.

TABLE XII

LAND DISTRIBUTION BY AGE OF FARM LANDOWNER AND BY AGE OF FARM OPERATOR, ESTIMATED OKLAHOMA TOTALS, 1977 AND 1974 RESPECTIVELY.

Age	Sample Individual Landowner Acreage Percentage	Estimated Okla. Individual Landowner Acreage Distribution	Estimated Okla. Farm Operator Acreage Distribution	Percent
25 & Under	1.01	275,376	323,910	1.42
26 - 34	2.35	638,982	1,702,687	7.47
35 - 44	9.52	2,588,290	3,367,775	14.78
45 - 54	20.93	5,690,207	5,983,897	26.26
55 - 64	24.57	6,679,363	6,896,118	30.26
65 & Over	41.63	11,318,195	4,515,584	19.81
total	100.00	27,190,413	22,789,971	100.00

There are approximately 27.2 million acres of individually owned farmland in Oklahoma. Eighteen million acres, or 66.2 percent, of the farmland acreage is owned by individuals 55 years of age or older. Thus, a large amount of Oklahoma farm acreage is owned by people who will attain the "usual" retirement age of 65 within the next decade. Landowners 44 years of age and younger own only a estimated 12.88 percent of Oklahoma's farmland. These data suggest that a large portion of farmland in Oklahoma may be available for sale or rent over the next decade.

For comparison, the Oklahoma acreage distribution by age of farm operator is also presented in Table XII. The farm operator data is from the 1974 Census of Agriculture and the farm landowner data is representative of 1977. As expected, farm operators are predominant in the younger age categories with 49.93 percent of Oklahoma's land in farms operated by farmers 54 years of age and younger. This compares with 33.81 percent of the acreage owned by persons 54 years and younger. The most significant difference is noted in the 65 and over age category. Almost 42 percent of Oklahoma's farmland is owned by people 65 years of age and older, whereas, only 19.81 percent of Oklahoma's farmland is operated by people over 65.

Data from the 1958 Great Plains land ownership survey reveal that in 1958, 56.5 percent of the farmland in Oklahoma was owned by people 55 years of age and older. For comparison, the results of this landowner survey indicate that 66.2 percent of Oklahoma's farmland is owned by persons 55 and older. Different data collection methods prevent direct comparison of these two surveys. However, they do suggest the possible trends in landowner age patterns for Oklahoma farmland.

Projected Farm Real Estate Transfers

Projected farm real estate transfers for Oklahoma from 1977 through 1986 are presented in Table XIII. Farmland transfers are projected by age category from the Oklahoma landowner acreage distribution according to the age and corresponding anticipated mortality rate of the landowner (14). These projections are based on the assumption that the landowner will retain ownership of the land until death. Thus, if 8.6 percent of Oklahoma's farm landowners are expected to die in 1977, 8.6 percent of the individually owned land in Oklahoma will be expected to transfer. For example, in 1977 there were an estimated 5,690,207 acres of Oklahoma farmland owned by people in the 45-54 landowner age category. The median age of 50 has an associated mortality rate of .00832. The 1977 anticipated acreage transfer of 47,343 acres was derived by taking .00832 percent of 5,690,207 acres. The anticipated acreage transfer for 1977 is then subtracted from the 1977 base of 5,690,207 acres and the process begins again for 1978 (Appendix B).

Farm real estate transfers in Oklahoma are expected to increase from approximately 757,725 acres in 1977 to 946,406 acres in 1986, a 24.9 percent increase. Over the next decade, an estimated 8.7 million acres of Oklahoma farmland is expected to transfer, 26.2 percent of the total land in farms. Although U.S. farmland transfers have been relatively steady over the past three years, the extremely large acreage totals held by landowners over 65 years of age suggest increased farmland transfers in Oklahoma. Over 6.0 million acres, or 69.2 percent of the total anticipated acreage transfer is expected to come from landowners currently 65 years of age or older. About 1.8 million acres are expected to be transferred by individuals 55 through 64 years of

TABLE XIII

ANTICIPATED ANNUAL FARM REAL ESTATE TRANSFERS, OKLAHOMA, 1977-1986

Year	25 and Under	26-34	35-44	45-54	55-64	65 and Under	Total Anticipated Acreage Transfer
				Acres			
1977	493	1,361	9,137	47,343	135,858	563,533	757,725
1978	503	1,396	9,904	51,406	145,528	582,365	791,102
1979	510	1,432	10,714	55,691	155,535	596,605	820,487
1980	518	1,473	11,590	60,285	165,862	605,758	845,486
1981	522	1,520	12,531	65,158	176,464	611,032	867,227
1982	527	1,586	13,559	70,334	187,329	613,293	886,628
1983	534	1,664	14,697	75,881	198,462	613,297	904,535
1984	541	1,760	15,939	81,804	209,765	611,239	921,048
1985	551	1,887	17,307	88,099	221,094	606,851	935,789
1986	563	2,031	18,794	94,701	231,857	598,460	946,406

age. Thus, 7.8 million acres, or 90.25 percent of the total projected transfer acreage, is expected to convey from landowners 55 years and older.

It is not possible to estimate the age of the purchasers of the projected farmland transfers. However, it is likely that the majority of the transfer acreage will be purchased by established farmers. Farm enlargement is becoming more important as farmers strive to spread their fixed capital and labor costs over more acres. In 1977, farm enlargement accounted for 64 percent of all farmland purchases in the Southern Plains (15). Established farmers will most likely belong to one of the older landowner age categories. Therefore, the projected farm real estate transfers presented in Table XIII can be considered minimum acreage estimates because annual adjustments cannot be made in the landowner distribution for new landowners.

Projected Capital and Credit Requirements

Annual estimated farm real estate capital and credit requirements associated with the projected transfers are presented in Table XIV. The average value of farm real estate per acre in Oklahoma was $379 in 1977 (8). Annual total capital estimates through 1986 are based on both a constant land value of $379 and assuming a 5.0 percent annual inflation rate in land values.

Farm real estate transfer data from the Southern Plains region indicate that since 1975 an average of 85.0 percent of the farmland transfers required debt financing (15). The credit-financed farmland transfers incurred an average ratio of debt to purchase price of 76.0 percent. Thus, the average debt on the value of farmland transferred

TABLE XIV

PROJECTED CAPITAL AND CREDIT REQUIREMENTS, OKLAHOMA, 1977-1986

Year	Projected Farmland Transfers (acres)	Total Capital Constant Land Values (thou. $)	Debt Capital Required (thou. $)	Total Capital 5% Increasing Land Values (thou. $)	Debt Capital Required (thou. $)
1977	757,725	287,178	186,666	287,178	186,666
1978	791,102	299,828	194,888	314,859	204,658
1979	820,487	310,965	202,127	342,964	222,926
1980	845,486	320,439	208,285	371,168	241,259
1981	867,227	328,679	213,641	399,792	259,865
1982	886,628	336,032	218,421	429,128	278,933
1983	904,535	342,819	222,832	459,504	298,677
1984	921,048	349,077	226,900	490,919	319,097
1985	935,789	354,664	230,532	524,042	340,627
1986	946,406	358,688	233,147	556,487	361,716

in the Southern Plains region since 1975 has been approximately 65 percent. The Federal Land Bank Associations of Oklahoma have over the past two years loaned an average of 64.6 percent of the appraised value of the loan security (7). The loan security, as used here, includes only the value of the farm real estate purchased. Therefore, future credit needs for farmland transfers were projected on the basis of 65 percent of the total capital requirement.

The projected capital and credit needs under constant land prices indicate a 24.9 percent increase over the next decade. Total capital requirements increase proportionally with projected acreage transfers assuming a constant land price. Total debt capital required for farm purchases increased from $186.7 million in 1977 to $233.1 million in 1986 under condition of zero inflation. The projected debt capital requirements assuming constant land prices suggest a possible minimum requirement of future farm real estate debt capital. These estimates may be realistic if most of the acreage transfers to current farmers who have received the benefit of land price appreciation. Also, this situation develops if farmers in the future rent a small proportion of their total farmland so that land appreciation benefits are realized.

Total capital requirements, assuming a 5.0 percent annual increase in land values, are projected to reach $556.5 million in 1986. A projected 93.8 percent increase in capital needs for Oklahoma farm real estate purchases. An estimated $361.7 million will be needed to accommodate the farm real estate credit needs of farm purchasers in 1986. Over the next decade, farm credit lenders will be asked to furnish an estimated $2.7 billion dollars. The projected debt capital requirements under conditions of 5.0 percent inflation represent what

might be considered maximum estimates from the standpoint of increasing land prices. The estimates may materialize if the majority of the Oklahoma farm real estate transfers by sale in the future. In 1977, 64.7 percent of the Oklahoma farmland transfers were voluntary sales and less than 5 percent involved gifts or inheritance (15). Thus, it is likely most future farmland transfers will require capital outlays.

For the year ending March 1, 1977, a total farmland transfer debt of $766 million was incurred in the Southern Plains region (15). The Southern Plains region consists of Oklahoma and Texas. Assuming the farmland transfers in Oklahoma and Texas were proportional to their respective land in farms, Oklahoma's share of the debt would be $188.9 million. In this study, the projected debt requirements for Oklahoma for the year ending December 31, 1977 were $186.7 million. The comparison indicates very little variation for approximately the same time period.

CHAPTER V

SUMMARY AND CONCLUSIONS

Introduction

The purpose of this study was to determine the age distribution of Oklahoma's farm and ranch landowners in order to project the level of farmland transfer in Oklahoma over the next decade. In addition, annual capital and credit needs were estimated for the anticipated farm real estate transfers.

Due to the vast universe of landowners in Oklahoma, a sample survey was conducted. The design of the survey involved dividing the state into type-of-farming areas and taking a random sample within each area. The state was divided into five major farming areas including Irrigated Cropland, Cotton, Cash Grain, Timber Land, and General Farming-Livestock. A sample size of 60 was selected to estimate the landowner age distribution. The size of the sample within each area was proportional to the size of the farming area to permit the same degree of reliability from each type-of-farming area.

After the sample townships were selected, every landowner of record within the township was identified and an attempt was made to obtain an age estimate for each individual landowner. One to several individuals, depending on the density of landowners, were contacted personally in each township and asked to provide age estimates of their neighboring landowners. The landowner acreage was placed in one of the

following age categories: 25 and under, 26-34, 35-44, 45-54, 55-64, and 65 years of age and older. Landowners of record also included corporations, government, BIA, estates, and trusts and were tabulated as such. To test the reliability of the data, a mail questionnaire was conducted to compare the estimated age category received in the peer survey with the age category reported by the landowner himself. To compare the results of the two surveys, the Chi-square test of homogeneity was employed. The results of the test suggest that the sample landowner data are representative of the universe of landowners in Oklahoma.

Summary of Results

Oklahoma Farm Landowner Distribution

There are approximately 33,082,848 acres of land in farms in Oklahoma according to the 1974 Census of Agriculture. The form of ownership was identified for 1,175,511 acres or 3.55 percent of the land in farms. Individual ownership was predominant with 25.7 million acres for 77.78 percent, followed by 8.43 percent in government ownership, 6.8 percent in estates, 5.0 percent corporate owned, 1.10 percent under the Bureau of Indian Affairs, and .88 percent in trusts.

The individually owned land was concentrated in the 55 years of age and older categories, evidenced by 66.2 percent of the acreage held by those landowners. Landowners 55 years and older were predominant in all types of farming areas except the Timber land area. The Timber area was the only area where landowners 55 years of age and older held less acreage than those 54 years and younger. The Timber area was dominated by corporate and government ownership and the resulting

individually owned acreage was too small to accurately determine an individual landowner age distribution.

The results of Duncan's multiple range test indicate that, with the exception of the Timber area, there were no distinguishable differences between the pattern of land ownership among the type-of-farming areas. Landowner age distributions for central, eastern and western Oklahoma were similar for all age categories except the 35-44 and 65 and over categories. In both categories, eastern Oklahoma was dissimilar due to the influence of the Timber area sample townships in southeastern Oklahoma. Therefore, due to the dissimilarity of acreage percentage means of the Timber area with respect to other types of farming in Oklahoma, the five Timber area sample townships were not used to project Oklahoma farm real estate transfers.

Projected Farm Real Estate Transfers

Projected farm real estate transfers for Oklahoma through 1986 were projected from the Oklahoma landowner acreage distribution according to the age and corresponding standard mortality rates of the landowner. Farmland transfers are expected to increase to over 946,000 acres in 1986, a 24.9 percent increase. Over the next decade, an estimated 8.7 million acres of Oklahoma farmland is expected to transfer, 26.2 percent of the total land in farms. Over 6.0 million acres, 69.2 percent of the total anticipated acreage transfer, is expected to convey from landowners currently 65 years of age or older.

Projected Capital and Credit Requirements

The average debt on the total value of farmland transferred in the Southern Plains region since 1975 has been approximately 65 percent. Therefore, future credit needs were projected on the basis of 65 percent of the total capital requirement. Annual capital and credit requirements were estimated on the basis of constant land prices and also assuming a five percent inflation rate in land prices.

Projected capital and credit needs under constant land prices imply a 24.9 percent increase over the next decade. Total debt capital requirements increase from $186.7 million in 1977 to $233.1 in 1986. The projected debt capital requirements assuming constant land prices suggest possible future minimum requirements.

Projected capital requirements under conditions of increasing land prices indicate a 93.8 percent increase for Oklahoma over the next decade. Total capital requirements are estimated to reach $556.5 million in 1986 accompanied by a $361.7 million debt capital requirement. Over the next decade, farm credit lenders will be asked to furnish an estimated $2.7 billion. Projected capital and credit needs assuming increasing land prices represent what might be considered maximum estimates. These estimates may be realistic if most of the acreage transfers by sale in the future.

Conclusions

The most apparent conclusion that can be drawn from this study is that the majority of Oklahoma's farm and ranch landowners are rapidly approaching the "usual" retirement age of 65. There is no prescribed age to retire from farmland ownership. However, it is evident that

Oklahoma's farm landowners are old relative to farm operators. The acreage distribution by age of landowner indicate that in 1977, 66.2 percent of Oklahoma's land in farms was owned by people 55 years of age and older, compared to 56.46 percent in the 1958 Great Plains survey. These two surveys cannot be compared directly because of different data collection methods. However, they do suggest the possible trend in the Oklahoma landowner age distribution. Due to the extensive ownership of Oklahoma's farmland by older farmers, 8.7 million acres are estimated to be available for transfer over the next decade. In order for the family farm to remain the dominant production unit in agriculture, there is a need for the efficient transfer of Oklahoma farmland into the hands of the young landowner.

Future capital and credit requirements for Oklahoma farm real estate purchases will increase significantly over the next decade. This is evident assuming constant land prices and is magnified when increasing land prices are considered. By 1986, estimated debt-capital requirements for farmland purchases are expected to reach $233.1 million assuming no inflation in land prices or $361.7 million assuming five percent inflation.

Capital and credit requirements are directly influenced by future land prices as well as by the extent of future land transfers. Farmland sellers have become increasingly aware that farm enlargement often allows purchasers to pay a premium price for an additional tract because they can decrease their fixed costs per acre. Other than farm income, credit availability is the most important factor affecting land prices. As long as debt capital is available, established farmers will continue to expand.

The most important factor affecting the transfer of land to young landowners is ability to obtain sufficient financing. The projected debt-capital requirements for farmland purchasers over the next decade total just over $2.7 billion. If the projected levels of capital and credit needs are realized, some farmers may experience difficulty in obtaining sufficient debt capital. This is especially true for young farmers, who characteristically have limited equity and generally have had little opportunity to demonstrate their ability as managers. These are serious limitations from the viewpoint of the traditional institutional lender. Lending agencies must become aware of the needs of young landowners if they are to assist them in leveraging their capital in a prudent way.

Suppliers of agricultural credit must evaluate their ability to meet the future demands of Oklahoma farm real estate purchasers. In order for lending agencies to keep pace with the rapidly changing credit needs of Oklahoma agriculture, credit policy makers must make adjustments now to prepare for the future. They must continue to formulate sound, adequate, and constructive credit policies. Only through the use of increasingly large amounts of debt capital have farmers been able to successfully pass the ownership of agricultural resources to the succeeding generation.

Considering the future farmland ownership structure in Oklahoma, the individual landowner will continue to be the predominant landowner. No attempt is made to project the future trends in types of farm organizations, such as partnerships and farm corporations. Future landowners will have to learn to effectively manage the larger amounts of capital which will be necessary to sustain a viable farm operation.

Non-individual land ownership patterns, such as large corporations and government holdings, have remained fairly constant since the 1930's. No drastic changes are expected in their farmland share. It is evident that the future structure of agriculture in Oklahoma will depend on the actions and trends of lending institutions, land-use planners, and farm policy makers.

Limitations and the Need for Further Research

The most serious limitation with this study is the data requirements. Age estimates were simply not obtainable for many landowners. Also, information concerning individual landowner characteristics such as occupational pursuits, entrepreneurial status, method of acquistion, and legal form of ownership is not available with a survey of this type. It was necessary to use Southern Plains farm real estate transfer data to estimate the average debt on the value of farmland transferred in Oklahoma because this information was not directly reported for Oklahoma farms.

Further research is needed concerning the purchasers of Oklahoma farm real estate. It would be helpful in projecting future farmland debt capital requirements to know the age and economic class of these new farmland purchasers. Information concerning the economics and tax benefits of selling versus inheritance would be helpful. This information might improve the efficiency with which farmland transfers.

The capital and credit requirements for Oklahoma farm real estate purchases are expected to increase significantly over the next ten years. Research is needed in the area of farm credit availability so that sufficient capital will be available to fulfill the credit demands

of farmland purchasers. The effect of farm income, inflation, and the level of agricultural land prices on the rate of farmland transfers would be informative. The future structure of American farmland ownership may depend in part on the ability of credit institutions to meet the increasing capital needs of Oklahoma and American agriculture.

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APPENDIXES

APPENDIX A

MAIL QUESTIONNAIRE USED IN STUDY

Name_____

County _____

Dear Sir:

Oklahoma State University, Department of Agricultural Economics, is currently conducting a study on land ownership patterns in Oklahoma. The purpose of this study is to determine the average age of landowners in Oklahoma in order to estimate the extent of land transfer and the resulting capital needs that may be anticipated over the next decade. The successful intergenerational transfer of farm assets requires knowledge regarding not only the extent of capital required, but also the sources of such capital.

The format of the study is to scientifically select target townships across the state, and then to identify individuals within those townships whose long residence and reputation allow them to provide estimates of the ages of landowners of record in that township. We are contacting selected individual landowners of record in an attempt to measure the reliability of this type of information.

We are placing landowners in one of six age categories:

1) 25 years of age and under
2) 26-34 years
3) 35-44 years
4) 45-54 years
5) 55-64 years
6) 65 and older

I would appreciate your cooperation in circling the age group of which you are a member and then returning this letter to me as quickly as possible. A self-addressed, postage paid envelope is provided. We appreciate your cooperation in this research effort.

Sincerely,

Ken Starks
Graduate Research Assistant
Agricultural Economics
Oklahoma State University

APPENDIX B

DERIVATION OF FARM REAL ESTATE TRANSFERS, OKLAHOMA, 1977-1986.

TABLE XV

DERIVATION OF FARM REAL ESTATE TRANSFERS,
OKLAHOMA, 1977-1986.

Age Category	Year	Age	Mortality Rate	Total Acreage	Anticipated Acreage Transfer
25 & Under	1977	20	.00179	275,376	493
	1978	21	.00183	274,883	503
	1979	22	.00186	274,380	510
	1980	23	.00189	273,870	518
	1981	24	.00191	273,352	522
	1982	25	.00193	272,830	527
	1983	26	.00196	272,303	534
	1984	27	.00199	271,769	541
	1985	28	.00203	271,228	551
	1986	29	.00208	270,677	563
26-34	1977	30	.00213	638,982	1,361
	1978	31	.00219	637,621	1,396
	1979	32	.00225	636,225	1,432
	1980	33	.00232	634,793	1,473
	1981	34	.00240	633,320	1,520
	1982	35	.00251	631,800	1,586
	1983	36	.00264	630,214	1,664
	1984	37	.00280	628,550	1,760
	1985	38	.00301	626,790	1,887
	1986	39	.00325	624,903	2,031
35-44	1977	40	.00353	2,588,290	9,137
	1978	41	.00384	2,579,153	9,904
	1979	42	.00417	2,569,249	10,714
	1980	43	.00453	2,558,535	11,590
	1981	44	.00492	2,546,945	12,531
	1982	45	.00535	2,534,414	13,559
	1983	46	.00583	2,520,855	14,697
	1984	47	.00636	2,506,158	15,939
	1985	48	.00695	2,490,219	17,307
	1986	49	.00760	2,472,912	18,794

TABLE XV (Continued)

Age Category	Year	Age	Mortality Rate	Total Acreage	Anticipated Acreage Transfer
45-54	1977	50	.00832	5,690,207	47,343
	1978	51	.00911	5,642,864	51,406
	1979	52	.00996	5,591,458	55,691
	1980	53	.01089	5,535,767	60,285
	1981	54	.01190	5,475,482	65,158
	1982	55	.01300	5,410,324	70,334
	1983	56	.01421	5,339,990	75,881
	1984	57	.01554	5,264,109	81,804
	1985	58	.01700	5,182,305	88,099
	1986	59	.01859	5,094,206	94,701
55-64	1977	60	.02034	6,679,363	135,858
	1978	61	.02224	6,543,505	145,528
	1979	62	.02431	6,397,977	155,535
	1980	63	.02657	6,242,442	165,862
	1981	64	.02904	6,076,580	176,464
	1982	65	.03175	5,900,116	187,329
	1983	66	.03474	5,712,787	198,462
	1984	67	.03804	5,514,325	209,765
	1985	68	.04168	5,304,560	221,094
	1986	69	.04561	5,083,466	231,857
65 & Over	1977	70	.04979	11,318,195	563,533
	1978	71	.05415	10,754,662	582,365
	1979	72	.05865	10,172,297	596,605
	1980	73	.06326	9,575,692	605,758
	1981	74	.06812	8,969,934	611,032
	1982	75	.07337	8,358,902	613,293
	1983	76	.07918	7,745,609	613,297
	1984	77	.08570	7,132,312	611,239
	1985	78	.09306	6,521,073	606,851
	1986	79	.10119	5,914,222	598,460

VITA

Kendal Wayne Starks

Canidate for the Degree of

Master of Science

Thesis: AN ANALYSIS OF LAND OWNERSHIP PATTERNS IN OKLAHOMA TO PROJECT FUTURE FARM REAL ESTATE TRANSFERS AND FINANCIAL NEEDS

Major Field: Agricultural Economics

Biographical:

Personal Data: Born in Prague, Oklahoma, November 19, 1953, the son of Dr. and Mrs. Walter L. Starks.

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